International Journal of Economics and Financial Management (IJEFM)
E-ISSN 2545-5966 P-ISSN 2695-1932 Vol 10. No. 2 2025 www.iiardjournals.org Online Version

Financial Risk and Commercial Banks Soundness: A Panel Data Study of Quoted Commercial Banks in Nigeria

Sirah Patience Barisua
Department of Finance, Rivers State University, Port Harcourt
DOI: 10.56201/ijefm.v10.no2.2025.pg1.28

Abstract
This study focused on the effect of financial risk on commercial banks soundness in Nigeria. The specific objective was to investigate how credit risk, interest rate risk, exchange rate risk, liquidity risk and cash flow risk affect commercial banks soundness. Two multiple regression was formulated to examine the effect of the independent variables on the dependent variables. Commercial banks soundness was measured by asset quality indicator and earnings and profitability indicator. Cross sectional data was sourced from financial statement and annual report of 15 quoted commercial banks in Nigeria. Ordinary least method of unit root and granger causality test was used to investigate the dynamic effect of financial risk on commercial banks soundness. The study found that financial risk can explain 30% variation on asset quality indicator; cash flow risk, credit risk and exchange rate risk have negative effect while interest rate risk and liquidity risk have positive effect on asset quality indicator. The study further found that 59% variation on earnings and profitability indicators can be explain by variation on financial risk, cash flow risk, exchange rate risk and liquidity risk have positive effect while credit risk and interest rate risk have negative effect on earnings and profitability indicator of Nigeria commercial banks. The cointegration test proved that variable is stationary while the granger causality test validates the presence of bi-directional causality. We conclude that financial risk has significant effect on capital adequacy, earnings and profitability indicators but moderate effect on asset quality indicator. We recommend that management of commercial banks should diverse both short and long run strategies to manage financial risk in Nigeria banking environment.

Keywords: Financial Risk, Commercial Banks Soundness, Panel Data Study, Nigeria

INTRODUCTION

Taking risk is an integral part of the banking business and also the pro-cyclicality amplification of the financial shocks throughout the banking system, financial market and the broader economies requires a well-structured and regulated banking environment to manage risk and achieve financial system stability. The objective of the Basel Committee was to device measures to make banks more resilience to pro-cyclicality dynamics in the operating environment (Ayadi, Naceur, Casu& Quinn, 2015). However, systemic risk is the essential feature of systemic banking crisis and it is characterized by the spread of shocks throughout the entire financial system, which affects the entire financial system. First, systemic risk is related to the banking system because of uncertainty

and information asymmetry which characterizes developed and liberalized economies. Secondly, the smooth functioning of these economies depends on banking stability since the supply and demand of liquidity are mainly taking place through the banking sector (Clavier, 2011). Bank soundness in an economy is an important catalyst for economic growth due to its function in facilitating exchange of value (Swamy, 2014; Lucky & Tamunoiduabia, 2022;).). Through their functions, they facilitate the flow of funds from surplus households to deficit households in a more efficient manner thereby promoting economic growth and development (Ratnovski, 2013). Commercial banks need to proactively study the operating environment and develop relevant strategies that would reduce the severity of their exposure to situations that are likely to affect their financial stability. Banks are exposed to classical operational risks like infrastructure breakdown, supply problems, environmental risks. More typical and important for a bank are the financial risks it takes by its transformation and brokerage function. Essentially, the bank's main activity is to buy and sell financial products with different profit and risk characteristics. This transformation from supply to demand side is not without risk. Banks are exposed to credit, market, operational, interest rate and liquidity risk.

Conceptually bank soundness describes the condition where banks functions smoothly thereby building confidence among users (Merga, 2013; Akani & Lucky, 2022). . It refers to the smooth operation of the system of banks between households, firms and the government through a range of financial institutions supported by a myriad of financial infrastructure (Khan, 2011).Financial risks of banks can result to bank distress, failure and financial crisis in an economy. However, there is apremise in finance is that there is a connection between risk and return. Higher risk is assumed to lead to higher return on stocks with rationale pricing of stocks. Highly profitable firms are riskier than the average (Fama and French, 2015). Finance theories suggest that there is a positive relationship between risk and returns. However, it is also possible that high risk leads to financial distress which can result in lower future profitability. Conceptually, risk is the probability of loss or failure. Financial risk emerges from the financing of corporate entities such as leverage while operating risk emerges from the operation of a firm. However, the regulation and supervision of banks are relevant to reduce bank failures. Consequently, the basic objectives of prudential regulation and supervision of banks are to prevent systematic banking distress, protection of depositors, savings and the encouragement of financial intimidation, specifically ensure optimal risk diversification, prevent adverse selection and risk aversion and promote sound and stable financial system. It is there relevant to examine the relationship between financial risk and commercial bank soundness in Nigeria.

The regulators of the banking system aimed at preventing costly banking system crises and their associated adverse feedback effects on the real economy (Jahn & Kick, 2012). A dysfunctional financial industry puts pressures on businesses and households thereby adversely affecting the real economy as capital may be prevented from flowing to worthy investments and may lead to credit crunches. In order to ensure that the commercial banks remain sound to perform its financial intermediation role effectively, it is important that individual commercial banks implement relevant strategies to manage financial risk in the operating environment (Jahn & Kick, 2012; Lucky, Uzah, & Omubo-Pepple, 2023).

Over the past decades, banks and banking system globally have dealt with problem of financial system fragility and crisis emanating of risk taking behavior of the banking institution. In the late 1980s, the Basel Committee on banking and supervision launched the first set of guidance known as BaseI I to harmonize banking regulation. The objective was to improve banking system stability through capital adequacy measures to risk and fill the harmonization gap resulting to banking sector crisis (Demurgic-Kunt, Detragiache &Tressel, 2006). Basel II which was introduced in 2004 was based on three pillars which are minimum capital requirement, supervisory review and market discipline (Toby, 2006). This has been considered as the major driver for the refinement and maturation of risk management in the banking institution.

Basel III was introduced in 2008 after the global financial crisis, it requires banks to be more stringent by refining capital structure and built mechanism for risk management such as liquidity coverage ratio, net stable funding ratio to manage liquidity risk and suggest an additional non risk based leverage ratio as a security measure against any capital requirement deficiencies (Dell'Ariccia& Marquez, 2004). It incorporate the lessons learned from the global financial crises which results in liquidity and credit crouch (Atik, 2011).The arrival of Basel III, signals an unprecedented rising of the bar for risk management practice to support the comprehensive nature of the new requirement. The continuous collapse in the banking sector in Nigeria and global financial market queries the relevant of the policies formulated to achieve bank soundness. In Nigeria only 8 banks out of 24 was declared too big to fail in 2014,while there are many studies on factors that determine commercial bank soundness (Lucky, 2017; Toby, 2014; Dang, 2015; Vermoesen et al., 2013; Wehinger, 2014). The effect of financial risk as factor that determines commercial bank soundness is lacking in literature, therefore paper examined the effect of financial risk on commercial bank soundness in Nigeria.

LITERATURE REVIEW

Commercial Bank Soundness

Commercial bank soundness is maintained by sufficient capitalization which is characterized by the security level of risk assets and acted as the guarantor of bank reliability and liquidity, and also high profitability demonstrates effectiveness of credit organizations resources used (Hodachnik, 2009). Vagizova, Klaas and Batorshina, (2013) posited that problem areas of lack of financial stability by commercial banks are the poor quality of assets and liabilities due to a considerable share of the overdue credits and demand liabilities, dependence on interbank credits that on the one hand characterizes unstable position of bank, but on the other hand shows trust in bank from other banks, the aggressive credit policy, and also poor quality of credit portfolio.

According to Gómez (2015) some banks in financial instability are characterized by sufficient level of liquidity and qualitative resource base which is important because the raised funds take vital share in structure of bank resources and they provide to meet needs of the enterprises, the organizations and the population, including credit resources requirements. Relative instability banks were connected with undercapitalization, a considerable share of the interbank credits in structure of liabilities and overdue credits, poor quality of credit portfolio, and in some cases with aggressive credit policy and insufficiently stable resource base (Gómez, 2015).

Commercial Bank Soundness Indicators

With the recommendation of the IMF, Central bank of Bosnia and Herzegovina began with a compilation of selected FSI exclusively for the banking sector, primarily because the share of this sector in the overall financial system. In order to calculate those indicators aggregation and data consolidation were used. Aggregation is the summarization of data, so that the overall position of one or transaction for any group of reporting units is equal to the sum of data for all individual units within the group. Consolidation refers to the elimination of transactions between group members in order to express financial situation and performance of the group as one of the accounting subject in relation to other businesses outside the group, for statistical purposes. Consolidation of data is carried out on a group and sector level.

Financial Soundness Indicators: Profitability

To measure profitability, compiled FSI is as follows:

a) Return on average assets (ROAA) is an indicator of a set of basic indicators of financial soundness indicators and is intended to measure banks' efficiency in using its assets. This FSI provides an estimate of profit that can be used to cover losses in relation to assets. ROAA is calculated as the ratio of net income to average total assets.

b) Return on average equity (ROAE) measures the efficiency of banks in the use of capital. This FSI provides an average income that can be used to cover losses in relative to capital. ROAE is calculated as the ratio between net income and average capital.

c) Net interest income to total income is calculated as the ratio of net interest income and total income. Net interest income is the difference between total interest income and total interest expense.

d) Non-interest expenses to gross income measures the share of administrative costs in total revenue. This FSI is calculated as the ratio of non-interest expense and total revenue. The non-interest expenses include direct expense (cost value adjustments for items of the balance of risk and risk reserves for items and other off-balance sheet business and direct expenses) and operating expenses (salaries and expenses contributions, the cost of office space, other fixed assets and overheads and other operating costs).

Financial Soundness Indicators: Capital

Indicators that measure capital adequacy are:

a) Basic capital to total risk weighted is used to determine how the indicator of net capital to total risk weighted susceptible to changes in additional capital and regulatory reductions. Capital adequacy is measured by this indicator is calculated as the ratio of basic capital (Tier 1) and total risk-weighted, which consists of RWA and operational risk weighted (ORW).

b) Net capital to total risk weighted corresponding to methodology capital adequacy ratio (CAR) calculating, which is prescribed by Basel Core Principles for internationally active banks in the G10 countries, except that the calculation and analysis of capital does not include the impact of country risk and transfer risk. The capital adequacy ratio measured by this indicator is calculated as the ratio of net capital and total risk-weighted.

c) Although the prescribed CAR for internationally active banks to Basel Core Principles is 8% or more, the existing regulations in Bosnia and Herzegovina require this rate to be at least at 12%.

Financial Soundness Indicators: Liquidity

FSI liquidity is:

a) Liquid assets to total assets show how the banking sector is sensitive to liquidity crisis, and how it is able to meet the expected and unexpected demand for cash.

b) Liquid assets to short-term financial obligations as an indicator that measure liquidity mismatches of assets and liabilities, and gives an indication of the extent to which banks can withstand the withdrawal of short-term funds, and that they do not face with liquidity problem.

c) Short-term liabilities to total liabilities are short-term measure of participation in the total obligations, and represent a measure of liquidity risk caused by an unexpected increase in the share of total short-term financial obligations. It is calculated as the ratio of short-term liabilities to total liabilities.

Financial Soundness Indicators: Foreign Exchange Risk

Financial soundness indicators, which measures exposures to foreign exchange risk are FSI's who follow the sensitivity of the financial sector to market risks or the sensitivity to movements in exchange rates, interest rates and capital markets. Compiled FSI's which measure foreign exchange risk are as follows:

Loans in foreign currency and indexed loans to total loans are an indicator that calculates the share of loans in foreign currency and indexed loans to total loans. In countries where lending in foreign currencies are allowed, especially is important to monitor residents' share of loans denominated in foreign currencies.

Liabilities in foreign currencies to total financial obligations are one of auxiliary soundness indicator, and measure the relative importance of foreign sources of funding within the total liabilities. This indicator is necessary to observe together with the indicator loans in foreign currency and indexed loans to total loans; because the foreign exchange exposure of banks is less if the loans disbursed in foreign currencies are funded sources in foreign currencies. It is calculated as the ratio of liabilities in foreign currencies and the total financial obligations. It shows how the share of liabilities in foreign currencies in total financial obligations.

Net open position in foreign currencies in relation to the equity, belongs to one of basic FSI's. It is calculated as the ratio of net foreign exchange position and basic capital (Tier 1). Net foreign currency position is calculated as the sum of the values of all long and all short positions of individual banks. Individual foreign currency position is calculated as the sum of the amounts of assets items taken from the plus sign and liability items taken from the minus sign. Individual foreign currency position (open position) is the difference between items that relate to a particular foreign currency (including gold and other precious metals) in the assets and liabilities of the bank balance expressed in domestic currency (BAM), including the potential gain or loss.

Financial Soundness Indicators: Asset Quality

To measure the quality of assets compiled FSI are as follows:

a) Non-performing assets (NPA) to total assets measures the asset quality of the banking sector, and the participation of non-performing assets to total assets. NPLs accounted for the largest portion of poor quality asset and therefore this indicator gives a good picture of the quality of the loan portfolio.

b) NPA less net of provisions to the equity shows the proportion of non-performing assets not covered by the provision of basic capital, and provides indications of additional provisions which

could be taken to the existing NPA. It is important indicator of the ability of bank capital to absorb losses arising from non-performing loans.

c) NPLs to total loans represent an indicator of basic set of FSI. It is calculated as the ratio between the non-performing loans to total loans. This indicator is a measure of loans quality.

Financial Risk

Financial risk is the type of specific risk that encompasses the many types of risks related to a company's capital structure, financing and the finance industry. These include risks involving financial transactions such as company loans and exposure to loan default. Risk is linked with possible hazards and dangers, while in finance it is a technical matter of unpredictability in expected outcomes, both negative and positive. In other businesses and political settings, risk is closely associated with the spirit of enterprise and value creation (Power, 2007). Willet (as cited in Ale, 2009) defined risk as "the objectified uncertainty regarding the occurrence of an undesired event. Risk is inherent in any walk of life and can be associated with every human decision-making action of which the consequences are uncertain. Over the last decades, risk analysis and corporate risk management activities have become very important elements for both financial as well as non-financial corporations. Firms are exposed to different sources of risk, which can be divided into operational risks and financial risks.

Operational risks or alternatively business risks relate to the uncertainty regarding the firm's investments and investment opportunities, and are influenced by the product markets in which a firm operates. In addition to operational risks, unexpected changes in e.g. interest rates, exchange rates, and oil prices create financial risks for individual companies. As opposed to operational risks, which influence a specific firm or industry, financial risks are market-wide risks that can affect the financial performance of companies in the whole economy. Both kinds of risk exposure can have substantial impact on the value of a firm. To study the effect of risk on profitability, scholars need to have clear understanding what risk means in former literature. The conservative definition states that risk is the possibility of a loss or failure. However, in finance literature risk usually also has an upside. Volatility of returns/income is a common measure of this. Malkiel (1982) sums the reasoning behind this measure of risk: for an investor risk is the disappointment of not earning the expected return.

Financing risk comprises of financial leverage riskand borrowing cost risk. Financial leverage means the ratio of debt to equity. If this ratio gets too high, the company has no buffer to withstand potential losses and is in effect on the brink of bankruptcy, the borrowing cost as an absolute figure is not relevant, but the spread between borrowing cost and RNOA. If the company is creating high returns on its operating assets, it can in turn afford to pay high interest rates. However, if the average interest rate surpasses RNOA, every dollar of debt generates losses for the company.

Given that the total risk of a company is a product of operating leverage and financial leverage, Mandelker and Rhee (1984) tested whether companies try to balance these two risks, or whether an increase in the other leads to an increase in the other part as well. The latter could be expected to happen if financial leverage is increased due to the financing of fixed assets (operating leverage). The study found that companies with high operating leverage usually have lower financial leverage, and vice versa. This means that companies indeed balance their total risk level by choosing the amount of financial leverage on the basis of their cost structure.

A central part of a company's riskiness is its earnings volatility. The first item in the chain that influences earnings variability is variation in sales. This can be systematic or nonsystematic. Next, operating leverage (as defined earlier) comes into picture. The third item is business risk, which can be either systematic or nonsystematic. Lastly financial leverage determines what is left in the bottom line of earnings variability. As a product of different factors, it has both systematic components that result from market factors, and company specific factors. Studies do not usually focus on the risks mentioned above, but more often on either bankruptcy or credit risk, that are more interesting for investors and debtors. The ultimate form of risk realization, bankruptcy, refers to the situation where a company faces such financial distress that it has to discontinue its operations. Credit risk is a similar concept, but it describes the situation from the debtor's point of view; it means the probability of the company not being able to pay its interest and principal payments of its debt. Scott (1981) argues that theoretically a company goes bankrupt if:

1. Debt payments are larger than EBIT plus present value of future dividends or
2. Payable liabilities are larger than market value of assets.

However, both of these clauses are impossible to verify with fundamentals, but the existence of a theoretical basis for bankruptcy is reassuring. Scott (1981) also notes that failing to meet one's financial obligations should not too hastily be used as a synonym with going bankrupt. In sum, fundamental risk emerges from multiple directions, which means that no single measure of risk can be used in the analysis. Ideally all 'sub-areas' of risk should be addressed with specific risk proxies.

Credit Risk

Credit risk refers to delinquency and default by borrowers, that is, failure to make payment as at when due or make payment by those owing the firm. The need to include delinquency derives from the importance usually attached to the time of money in financial analysis: one naira received today is worth more than one naira received in the future. While delinquencies indicate delay in payment, default, denotes nonpayment and the former is unchecked, leads to the latter (Padmanaghan, 1988). The exposure to credit risk is particularly large for financial institutions such as commercial and merchant banks. When firms borrow money, they in turn, exposes under the credit risk.

Market Risks

Elmer (2014) defined Market Risk as the risk to earnings arising from changes in underlying economic factors such as interest rates or exchange rates, or from fluctuations in bond, equity or commodity prices. Banks are subject to market risk in both the management of their balance sheets and in their trading operations. Market risk is generally considered as the risk that the value of a portfolio, either an investment portfolio or a trading portfolio, will decrease due to the change in value of the market risk factors. There are three common market risk factors to banks and these are liquidity, interest rates and foreign exchange rates. Market Risk Management provides a comprehensive framework for measuring, monitoring and managing liquidity, interest rate, foreign exchange and equity as well as commodity price risk of a bank that needs to be closely integrated with the bank's business strategy.

Liquidity Risk

According to Greuning and Bratanovic (2009) a bank faces liquidity risk when it does not have the ability to efficiently accommodate the redemption of deposits and other liabilities and to cover funding increases in the loan and investment portfolio. These authors go further to propose that a

bank has adequate liquidity potential when it can obtain needed funds (by increasing liabilities, securitizing, or selling assets) promptly and at a reasonable cost. The Basel Committee on Bank Supervision, in its June 2008 consultative paper, defined liquidity as the ability of a bank to fund increases in assets and meet obligations as they become due, without incurring unacceptable losses. Bessis (2010) however considers liquidity risk from three distinct situations. The first angle is where the bank has difficulties in raising funds at a reasonable cost due to conditions relating to transaction volumes, level of interest rates and their fluctuations and the difficulties in funding counterparty. The second angle looks at liquidity as a safety cushion which helps to gain time under difficult situations. In this case, liquidity risk is defined as a situation where short-term asset values are not sufficient to match short term liabilities or unexpected outflows. The final angle from where liquidity risk is considered as the extreme situation. Such a situation can arise from instances of large losses which creates liquidity issues and doubts on the future of the bank. Such doubts can result in massive withdrawal of funds or closing of credit lines by other institutions which try to protect themselves against a possible default. Both can generate a brutal liquidity crisis which possibly ends in bankruptcy. There are many factors that affect banks own liquidity and in turn affect the amount of liquidity they can create. These factors have a varying degree of influence on the balance between liquidity risk and liquidity creation, or a bank's liquidity management. A bank's assets and liabilities play a central role in their balancing of liquidity risk and creation. Nnanna (2003) defined liquidity risk as the risk arising from bank having insufficient funds on hand to meet its current obligation. In view of Santomero (1984) described liquidity risk as the risk of funding crisis. While some would include the need to plan for growth and unexpected expansion of credit, the credit here is seen more correctly as the potential for a funding crisis. Such a situation would inevitably be associated with an unexpected event, such as a large chares off, loss of confidence or a crisis of national proportion such as a currency crisis. One of management's fundamental responsibilities is to maintain sufficient resources to meet liquidity requirements, as when cheque are presented for payment, deposits mature and loan request are funded. Managing liquidity risk forces a bank to estimate potential deposit losses and renew loan demanded.

Interest Rate Risk

In general, interest rate risk is the potential for changes in interest rates to reduce a bank's earnings or value. Most of the loans and receivables of the balance sheet of banks and term or saving deposits, generate revenues and costs that are driven by interest rates and since interest rates are unstable, so are such earnings. Though interest rate risk is obvious for borrowers and lenders with variable rates, those engaged in fixed rate transactions are not exempt from interest rate risks because of the opportunity cost that arises from market movements (Bessis, 2010). According to Greuning and Bratanovic (2009), the combination of a volatile interest rate environment, deregulation, and a growing array of on and off-balance-sheet products have made the management of interest rate risk a growing challenge. At the same time, informed use of interest rate derivatives such as financial futures and interest rate swaps can help banks manage and reduce the interest rate exposure that is inherent in their business. Bank regulators and supervisors therefore place great emphasis on the evaluation of bank interest rate risk management, particularly since the Basel Committee recommends the implementation of market risk based capital charges. Interest rate risk arises from changes in the prevailing rates of interest. For example, if a merchant

bank buys funds from a commercial bank at 27% and before the merchant bank can place the funds, the market rate of interest falls and the merchant bank can only get 25% of the funds placement, then a financial loss will be sustained by a merchant. Bank's interest rate risk is common in times of tight liquidity to financial market.

Cash Flow Risk

This is the change that the cash inflow from a given investment project when put on a present value basis and aggregated may not be sufficient to cover the cost of the project. Investment risk may arise from a number of factors most of them may be outside the control of the investing bank (systematic risk). For example, a down turn in the national economy may turn an otherwise proof investment opportunity into a very risky one unpredictable government policy such as ban on raw materials; importation can mar an otherwise profitable investment opportunity

Foreign Exchange Risk

This is the risk incurred when there is an unexpected change in exchange rate altering the amount of home currency need to repay a debt denominated in foreign currency. Bessis (2010) defines foreign exchange risk as incurring losses due to changes in exchange rates. Such loss of earnings may occur due to a mismatch between the value of assets and that of capital and liabilities denominated in foreign currencies or a mismatch between foreign receivables and foreign payables that are expressed in domestic currency. According to Greuning and Bratanovic (2009), foreign exchange risk is speculative and can therefore result in a gain or a loss, depending on the direction of exchange rate shifts and whether a bank is net long or net short (surplus or deficit)in the foreign currency.

Exchange rate risk arises from the potential loss emanating from the inherent fluctuation nature of exchange rates, particularly, since the Naira started depreciating steadily against the major international currencies, corporate bodies that require foreign productive inputs have been exposed to loss arising from changes in the relative value of the Naira vis-à-vis foreign currencies. For the banking industry, exchange rate risks would arise if the naira rises in value before a bank sell off its stock of foreign exchange. Conversely, exchange gains are realized as the naira depreciates. In principle, the fluctuations in the value of domestic currency that create currency risk result from long-term macroeconomic factors such as changes in foreign and domestic interest rates and the volume and direction of a country‘s trade and capital flows. Short-term factors, such as expected or unexpected political events, changed expectations on the part of market participants, or speculation based currency trading may also give rise to foreign exchange changes. All these factors can affect the supply and demand for a currency and therefore the day-to-day movements of the exchange rate in currency markets.

Foreign exchange risk is generally considered to comprise of transaction risk, economic risk and revaluation risk. Transaction risk is the price-based impact of exchange rate changes on foreign receivables and foreign payables, that is, the difference in price at which they are collected or paid and the price at which they are recognized in local currency in the financial statements of a bank or corporate entity. Alternatively known as business risk, economic risk relates to the impact of exchange rate changes on a country‘s long-term or a company‘s competitive position. With increasing globalization, capital moves quickly to take advantage of changes in exchange rates and

therefore devaluations of foreign currencies can lead to increased competition in both overseas and domestic markets. This phenomenon makes this component of foreign exchange risk very critical for its management. The third component, revaluation or translation risk arises when a bank‘s foreign currency positions are revalued in domestic currency, and when a parent institution conducts financial reporting or periodic consolidation of financial statements. Banks conducting foreign exchange operations are also exposed to foreign exchange risk in forms of credit risks such as the default of the counterparty to a foreign exchange contract and time-zone-related settlement risk.

Financial Intermediation Theory

Financial intermediation is a process which involves surplus units depositing funds with financial institutions who then lend to deficit units. In earlier theories of financial intermediation, such as Gurley and Shaw's (1960), the main activity of intermediaries was the transformation of securities issued by firms (shares and bonds) into securities demanded by investors (deposits). Financial intermediaries are valuable because they provide services of divisibility and risk transformation, which borrowers cannot obtain on their own under identical conditions due to transaction costs. Matthews and Thompson (2008) identify that financial intermediaries can be distinguished by four criteria: one is their main category of liabilities (deposits) are specified for a fixed sum which is not related to the performance of a portfolio; second is the deposits are typically short-term and of a much shorter term than their assets; third, is that a high proportion of their liabilities are chequeable (can be withdrawn on demand); the fourth criteria to distinguish financial intermediaries are their liabilities and assets that are largely not transferable. There are exceptions such as certificates of deposit and securitization.

International Fisher Effect

This theory uses interest rates as opposed to inflation rates used by purchasing power parity theory. However, since interest rate and inflation are highly correlated, the two theories are closely related. According to International fisher effect, nominal risk free interest rates contain a real rate of return and an anticipated inflation meaning that if investors require the same real return, interest rates differentials between countries maybe the result of expected inflation. It further suggests that foreign currencies with relatively high interest rates will depreciate because the high nominal interest rates reflect expected inflation. The nominal interest rate would also incorporate the default risk of an investment.

Financial Economic Theory

The financial economic theory states that corporate risk management is appropriate to increase firm value in the presence of capital market imperfections such as bankruptcy costs, a convex tax schedule, or underinvestment problems. According to Carter et al. (2006) risk management can increase shareholder value by harmonizing financing and investment policies. A credible risk management can mitigate underinvestment costs by reducing the volatility of firm value. As the underinvestment problem which includes financial risk management is likely to be more severe for firms with significant growth and investment opportunities, various measures such as the market-to-book ratio, research and development to sales ratio, capital expenditure to sales, net assets from acquisitions to size which are indicators of financial performance are used for testing the underinvestment hypothesis.

Empirical Review

Mekasha (2011) studied credit risk and its impact on the performance of a sample of six Ethiopian commercial banks using return on asset as a surrogate of performance and nonperforming loan to total loan ratio, loan provisions to nonperforming loan ratio, loan provision to total loan ratio and loan provision to total assets ratio used as a surrogate of credit risk measures. The result revealed that nonperforming loan to total loan ratio and loan provision to total loan ratio have inverse relationship with return on asset but only nonperforming loan to total loan was statistically significant. Whereas loan provision to nonperforming loan and loan provision to total asset have positive association with return on asset but both are insignificant to impact return on asset.

Awoke (2014) conducted a study on the impact of credit risk on the performance of samples of eight commercial banks in Ethiopia over the period of years 2008-2012 using return on asset as dependent variable and provision to total loans, loans to total assets, cost to total loans and natural logarithm of total asset as independent variables. The findings shown that provisions to total loans and cost to total loans have inverse association with return on asset but loans to total assets and the natural logarithm of total assets have positive association with return on asset and all variables have significant impact on return on asset. Bizuayehu (2015) carried out a study on the impact of credit risk on the financial performance of banks in Ethiopia using bank specific and macroeconomic factors covering a period of years 2003-2008. Return on equity used as a proxy for financial performance and nonperforming loan to total loan ratio, capital adequacy ratio and total loan to deposit ratio, bank size, interest rate spread, gross domestic product and inflation rate as a proxy for credit risk. The study revealed that both bank specific factors and macroeconomic factors have inverse association with return on equity but only the bank specific factors are significant factors influencing return on equity. Gizaw, Kebede and Selvaraj (2015) evaluated the impact of credit risk on the performance of commercial banks in Ethiopia over a period of years 2003-2004. Return on asset and return on equity used as proxy of performance and nonperforming loan to total loan ratio, capital adequacy ratio, loan and advance to deposit ratio and loan loss provision to total loan ratio were used as a proxy for credit risk. The findings revealed that non-performing loan to total loan and loan and advances to deposit have inverse association with return on asset while the other two have positive association with return on asset. However; only nonperforming loan to total loan and loan loss provision to total loan are statistically significant to impact return on asset. Further, the study revealed that except loan loss provision to total loan ratio all the proxies of credit risk have inverse relationship with return on equity and all are significant factors impacting return on equity.

Hosna, Manzura and Juanjuan (2009) ascertained credit risk management and profitability of commercial banks in Sweden over the period of years 2000-2008. Return on equity was used as profitability indicator while non-performing loan ratio and capital adequacy ratio were used as credit risk management indicators. The study revealed that credit risk management has effect on profitability of the sample banks but it varies across banks. **A**duda and Gitonga (2011) examined the relationship between credit risk management and profitability among commercial banks in Kenya spanning from 2000-2009. A correlations and regression analysis was used to do the empirical analysis. Return on equity was used as a dependent variable and non-performing loan ratio as explanatory variable. The study revealed that there is a linear relationship between return

on equity and nonperforming loan ratio and nonperforming loan ratio can be used as a measure of credit risk management which affects profitability at a reasonable level. **B**oahene, Dasah and Agyei (2012) carried out a study on credit risk and profitability of selected banks in Ghana over the periods of 2005-2009. Return on equity used as dependent variable and net charge-off rate, non-performing loan rate and the pre-provision profit as a percentage of net total loans and advances as independent variables while bank size, growth and capital structure were used as control variables. The study found that there was positive and significant relationship between credit risk and profitability of the selected banks in Ghana over the study period. **P**oudel (2012) conducted a study on the impact of credit risk management on the financial performance of commercial banks in Nepal for the period of years 2001-2011. Return on asset was used as a proxy for financial performance and default rate, cost per loan assets and capital adequacy ratio as a proxy of credit risk management. The study revealed that all credit risk indicators have an inverse impact on banks' financial performance however the default rate is the most predictor of financial performance.

Fredrik (2012) investigated the impact of credit risk management on the financial performance of commercial banks in Kenya over the periods of years 2006-2010. CAMEL components were used as a vector of credit risk management and return on equity as a vector for financial performance. The study has shown that there is a strong relationship between the CAMEL components and return on equity. **M**wangi (2012) conducted a study on the effect of credit risk management on the financial performance of commercial banks in Kenya over a period of years 2007-2011 utilizing return on equity as dependent variable and nonperforming loan ratio and capital adequacy ratio as independent variables. The findings of the study unveiled that nonperforming loan ratio and capital adequacy ratio impacts return on equity inversely and they are statistically significant factors that impacts return on equity. **K**urawa and Garba (2014) evaluated the effect of credit risk management on the profitability of Nigerian banks covering a period of 2002-2011. Return on asset was used as a proxy of profitability and default rate, cost per loan asset, capital adequacy ratio and age were used as a proxy for credit risk management. The finding showed that default rate, cost per loan assets and capital adequacy ratio impacts return on asset positively but only default rate and cost per loan assets are statistically significant. Conversely, the study unveiled that there is negative but significant relationship between age and return on asset.

Ojo et al. (2012) studied the impact of credit risk on commercial banks' performance in Nigeria for the period of 2000-2010. Return on asset used as dependent variable and ratio of non-performing loan to loan and advances, ratio of total loan and advances to total deposit and the ratio of loan loss provision to classified loan as a measure of credit risk. A panel regression analysis was used in order to perform the statistical analysis. The study found that the effect of credit risk on the performance of Nigerian banks over the study periods was cross sectional in variant i.e. the effect is similar across banks. **M**uritala and Taiwo (2013) carried out a study on the impact of credit risk management on the profitability of Nigerian banks over the period of years 2006-2010. Return on asset was used as a surrogate of profitability and the ratio of loan and advances to total asset and nonperforming loan to total loan were used as a surrogate of credit risk. The study revealed that both loan & advances to total asset and nonperforming loan to total loan have inverse

association with profitability and they significantly impact profitability-return on asset. **A**friyie and Akotey (2013) studied on credit risk management and profitability of rural banks in the BrongAhafo region of Ghana over the period of years 2006-2010. Return on asset and return on equity were used as a proxy for profitability while nonperforming loans ratio and capital adequacy ratio as a proxy for credit risk management. The result of the study unveiled that nonperforming loans ratio and capital adequacy ratios have positive association with profitability but only nonperforming loan ratio is a significant variable to influence profitability.

Kaaya and Pastory (2013) conducted a study on credit risk and commercial banks performance in Tanzania. Return on asset was used as a vector of financial performance and loan loss to gross loan, non-performing loan, loan loss to net loan, impaired loan to gross loan were used as vectors of credit risk. A multiple regression analysis was used to do the empirical analysis. Bank size and deposit were used as control variables in the analysis. The study revealed that there is a negative and statistically significant association between the credit risk indicators and financial performance over the study period. **C**harles and Kenneth (2013) conducted a study on the impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria for the period of 2004-2009. Return on asset was used as a dependent variable and loan loss provision, loans and advances, non-performing loans and capital adequacy ratio as independent variables. The study has shown that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on the bank's financial performance.

Olawale et al. (2013) studied risk management and financial performance of banks in Nigeria for the period of 2006-2009 by using return on equity and return on asset used as dependent variables and doubt loans and capital asset ratio as independent variables. The result of the study shows an inverse relationship between financial performance and doubt loans and statistically insignificant while capital asset ratio was found to be positive and significant. Abdelrahim (2013) carried out a study on the effectiveness of credit risk management of Saudi banks in the light of global financial crises. Return on equity was used as a proxy for financial performance and CAMEL components as a proxy of credit risk management. The study found out a positive and statistically significant relationship between effective credit risk management and liquidity and positive but insignificant relationship between credit risk management and capital adequacy, asset quality, management soundness and earnings. Veron (2015) examined on how financial stability could be enhance in Asia. One of the key measures is to diversify the financial sector in terms of both number of domestic competitors and types of saving and lending instruments available. Many central banks through their financial stability reports (FSRs) attempt to assess the risks to financial stability by focusing on a small number of key indicators. In Kenya, some banks have expanded their branch networks in the region.

Gachua (2011) examined the effect of foreign exchange exposure on firm's financial performance. The research found that unrealized foreign exchange gains/losses have an effect on the Net Income of listed companies as it was posted to either income statement or owners' equity. The level of foreign exchange gains or losses is determined by a large extent by prevailing inflation rates in the

country. Pitia and Lado (2015) sought to test of relationship between exchange rate and inflation in South Africa. The study found that an increase in interest rates should lead to an increase in the financial performance of commercial banks since this leads to an increase in the spread between the interest rates for savings and the interest rates for borrowing.

Tadesse (2015) found that exchange rate has statistically significant negative impact on the profitability of commercial banks. The result showed that exchange rate has statistically significant positive impact on the loan growth of banks. Githae (2012) examined the effects of interest rates spread on the financial performance of commercial banks in Kenya. Study results showed that a strong relationship exists between commercial banks financial performance and interest rate spread, inflation and default risks. The study recommended that the government ought to regulate prevailing inflation and interest rates as it would aid commercial banks to operate in a more stable environment. Jamal and Khalil (2011) concluded that the more banks are involved in international trade especially foreign transactions, the more they faced with more financial risks due to fluctuating inflation and interest rates which affects exchange rates. This in turn affects the attainable revenue from foreign exchange dealings and contracts. Kimani (2013) posited that the central bank rate, cash reserve ratio, open market operation and uncertainty are caused by possible outcomes due to changes in monetary policies aimed at controlling inflation and interest rates. This in turn affects banks' lending behavior by commercial banks. The more they give out loans they more they face credit risks which have the potential to sink commercial banks all together.

Podder (2012) evaluated the relationship between interest rates and financial stability of commercial banks and found that the relationship is particularly apparent for smaller banks than large. They further noted that a reduction in the interest rates during a recession period results in a slower growth in bank loans while at the same time increasing the amount ofnonperforming loans and thus increased loan losses. This therefore means that commercial banks, particularly the smaller ones may have a lot of difficulties in maintaining their financial performance when the market rates are on a decreasing trend (Podder, 2012). Interest rates affect both the commercial banks and their customers in two major ways. When the interest rates rise, customers are unable to service their existing loans which leads to losses to the commercial banks since if the situation continues that way, they are forced to write off their debts (Makkar& Singh, 2013). This eats into the profits of the company since it means that the commercial bank is not able to recover both the principal amounts loaned as well as the expected interest from the customers (Makkar& Singh, 2013). When the interest rates are too low, the interest earned from the loaned out amounts is negligible and thus contributes little to the profitability of the commercial bank. There is therefore need for a balance in the interest rates in order to ensure the banks benefit (Lipunga, 2014).

Onyango (2016) explored the relationship between loan duration and interest rates for commercial banks in Kenya. The research results revealed that an increment in lending risks results to increments in average loan duration of commercial banks. This increment in lending risks enables banks to control their overall risk exposure by limiting amounts lend to borrowers. This therefore enables them to protect their loan assets hence ensuring that they remain liquid and stable for the long run. The increments in loan durations as result of increments in interest rates enables banks

to potentially recover issued loans in rough economic times experienced in the economy. This is a counter-measure to recover more loans by issuing longer repayments period. This enables optimal recovery of loans thus influencing banks' ability to remain in operation despite prevailing adverse interest rates. Ekweny (2014) examined interest rates volatility on nonperforming loans portfolio of listed commercial banks in Kenya. Research results showed that interest rate volatility negatively affect the performance of non-performing loans portfolio. The study recommended that the country ought to handle its macroeconomic variables in an appropriate manner as changes in variables like inflation and interest rates bring about currency devaluation which affects commercial banks performance. In addition, proper macroeconomic policies need to be put in place in order to attain stability in Kenyan commercial banks performance. In essence, banks operations are affected to a great extent by prevailing level of inflation and interest rates as it affects possible returns. The aligning of operations so as to ensure that estimated changes in these rates are incorporated will reduce potential negative outcomes hence ensure that profitability and survival are attained.

Rashid and Yousaf (2016) examined the empirical determinants of financial strength of Islamic and conventional banks of Pakistan. They also investigated how the competitive conduct of banking affects the banking system stability. They used quarterly data of 10 conventional banks, 4 fully fledged Islamic banks, and 6 standalone Islamic branches of conventional banks of Pakistan. Their analysis covered the period 2006–2012. They found that Islamic banks are relatively more financially stable as they have a higher mean value of Z-score. Doing regression analysis, they found that several bank-specific variables, namely income diversity, loans to assets ratio, bank size, and market concentration ratio, are significant in determining the stability of banks of Pakistan. Finally, they have shown that, as compared with conventional banks, Islamic banks contributed more profoundly in the stability of financial sector during the examined period. Fu, Lin, and Molyneux (2014) investigated 14 Asia Pacific economies for the time period 2003 to 2010 to explore the impact of national institutions, bank competition, regulation concentration, and on individual bank fragility. The bank‟s fragility was measured by probability of bankruptcy and the bank‟s Z-score. They found that the risk could be reduced for the commercial banks by controlling certain macroeconomic, bank-specific, and regulatory parameters. They also found that tougher entry restrictions are good for the stability of banks, but strong deposit insurance schemes are significantly related with fragility of the bank.

Alam (2013) investigated whether banking regulations, supervision, and monitoring enhance or impede the technical efficiency and risk taking behaviour of Islamic banks across the globe. He found that financial regulations, strict monitoring of operations, and advanced supervisory power of authorities help to increase the technical efficiency of Islamic banks. More strict financial regulations and supervision can affect banking efficiency. He also found that a powerful supervisory body can also increase inefficiency of banks. Zhang, Wang, and Qu (2013) examined how law enforcement affects a bank‟s risk taking ability and efficiency. They used a sample of 133 commercial banks across 31 regions for the period from 1999 to 2008. They found that strong law enforcement leads to encourage larger bank risk taking behaviour in the region. Their findings suggested that Chinese commercial banks performance is greatly affected by law enforcement

efficacy within the region. They concluded that regions having a better legal environment and protection of intellectual property rights have positive and significant impact on the efficiency of banks.

Murari (2012) examined insolvency risk for 80 public, private, and foreign Indian banks. He constructed the Z index for the period 2005-2009. He found that the probability of bankruptcy of Indian banks has declined over the years. Das (2012) examined insolvency risk of commercial banks in India for the period 1998–2007. He found that Indian private banks are most risky, whereas, the foreign banks are found to be least risky for their fat capital cushion. Beck, Demirgüç-Kunt, and Maksimovic (2008) argued that countries that require banks to regularly report their financial data to regulators and market participants are financially stable. They emphasised the significance of transparency in making supervisory processes effective and strengthening market discipline. Lepetit, Nys, Rous, and Tarazi (2008) explored the impact of non-interest revenue on risk structure of banks. They used sample of 734 listed and non-listed banks in 14 European countries. Hermes and Meesters (2015) investigated how financial liberalisation and regulations effect bank efficiency. The efficiency of public listed banks of 61 countries was calculated using SFA. They found that the profit efficiency of commercial banks was conditional on the extent of financial regulation and financial liberalisation. Similarly, Gaganis and Pasiouras (2013) investigated the relationship between profit efficiency of commercial banks and financial supervision of central banks. They found that the profit efficiency of the banks decreases with increases in a number of the financial institutions supervised by the central bank. The independence of central bank was found to be negatively and significantly related to the profit efficiency of banks.

Lee and Chih (2013) investigated the impact of already implemented financial regulations on Chinese banking efficiency and risk. Using bank total assets they categorised banks as large and small banks. Their findings suggested that the cost to income ratio and provision coverage ratio both were found to be more important for large banks, while the loans to deposits ratio, the capital adequacy ratio, and the leverage ratio are found to be more important for small banks. Their findings further suggested that the liquidity ratio did not affect commercial banks of China.
Lin, Seade, and Song (2013) investigated the relationship between bank regulations, supervision, and efficiency of banks. They used an unbalanced panel of 72 countries covering the period 1999–2007. They found that strict restrictions on bank activities had a negative and significant relationship with the efficiency of the bank. They further found that there is a positive and significant relationship between capital regulation and the bank efficiency. Moreover, they found a significant relationship between efficiency and experienced supervisory and market based monitoring. Pasiouras, Tanna, and Zopounidis (2009) used SFA approach to analyse the impact of regulatory and supervision framework on bank efficiency. They included 615 commercial banks operating in 74 countries in their sample for the period 2000-2004. The results suggested that there is a positive and significant relationship between supervisory power and profit efficiency. The strict capital requirements were found to have a positive and significant relationship with the cost efficiency, but a negative relationship with the profit efficiency. Furthermore, they found that high

restrictions have negative and significant effects on the cost efficiency, whereas, positive and significant impacts on the profit efficiency.
Barth, Caprio, and Levine (2008) provided mixed results about the impact of financial regulations on the performance of commercial banks of 150 countries. They first highlighted the data insufficiency in order to calculate the impact of financial regulations on performance of the banks. Their empirical findings revealed that restricting banking activities can reduce the bank efficiency but it could also increase the probability of the bank default. They also found that stringent regulations are not significant for profit efficiency of the banks. Naceur and Omran (2008) explored the influence of financial regulations, financial and institutional development on commercial bank profitability across Middle East and North Africa (MENA) countries. He used the panel data covering the period 1989–2005. He found that bank-specific characteristics positively and significantly impact banks‟ net interest margin, cost efficiency, and profitability. The regulatory variables found to have a significant and positive impact on banks‟ performance. His empirical results also demonstrated that the corruption increases the cost efficiency and net interest margins. Finally, he suggested that improvements in law and order cause variable decreases in the cost of efficiency without affecting the overall performance of the banks.

Barth, Caprio, and Levine (2008) provided mixed results in the relationship between financial regulations and efficiency of commercial banks. They found that restricting banking activities can reduce bank efficiency, but it could also increase the probability of default of the bank. They also found that stringent regulations are not statistically significant for the profit efficiency.
Ellul and Yerramilli (2010) investigated on whether a strong and independent risk management is significantly related to bank risk taking and performance during the credit crisis in a sample of 74 large U.S. bank holding companies. They constructed a Risk Management Index (RMI) which is based on five variables related to the strength of a bank's risk management: a dummy variable whether the bank has a designated CRO who is a member of the executive board, a dummy variable whether the CRO is among the top five highly paid executives, the ratio of the CRO's total compensation to the Chief Executive Officer's (CEO) total compensation, a dummy variable whether at least one of the non-executive directors on the bank's risk committee has banking experience, and a dummy variable whether the bank's risk committee met more frequently in the respective year as compared to the average value across the other sample banks. Their findings indicate that banks with a high RMI value in 2006 had lower exposure to private- label mortgage-backed securities were less active in trading off-balance sheet derivatives and had a smaller fraction of non-performing loans, a lower downside risk and a higher Sharpe Ratio during the crisis years 2007-2008.

Juanjuan et al. (2009) in their study on credit risk management and profitability in commercial banks in Sweden highlighted that credit risk management has effects on profitability. The analysis further indicated that the impact of credit risk management on profitability for the 4 commercial banks sampled is not the same. The study was limited to identifying the relationship of credit risk management and profitability of four commercial banks in Sweden. The results of this study was limited to the banks sampled and was not generalized for all commercial banks in Sweden. Whereas Saunders et al. (1990) and Anderson and Fraser (2000) analyse the case of US, Konishi

and Yasuda (2004) and Marco and Fernandez (2008) present comparable studies for the cases of Japan and Spanish, respectively. Their studies add value to an existing gap in the literature with respect to risk measurements. Whereas Konishi and Yasuda (2004) reveal that size and capital buffer are significantly related to the two-factor CAPM and insolvency risk exposures, Marco and Fernandez (2008) show that size, profitability, and business types are significantly related to insolvency risk exposure. Regarding cross-country research, Laeven and Levine (2009) and Angkinand and Wihlborg (2010) find that size, credit quality, capital buffer, liquidity ratio, Gross Domestic Product (GDP) growth, inflation, and interest rate are significantly related to credit and insolvency risk exposures. Berger and DeYoung (1997) found lagged risk-weighted asset (RWA) is significantly and positively related to credit risk measured by non-performing loans (NPL) to total loans. They rationalized that a relatively risky loan portfolio will result in higher NPLs. Ahmed (1998) finds that provision of loan losses (PLL) to be positive and significantly associated with NPL. Hence, a higher PLL indicates an increase in risk and deterioration in loan quality. Fisher, Gueyie and Ortiz (2000) found similar results where LOANQUAL (loan loss provision to total loans) is positively related to risk.

Bercoff et al. (2002) using risk accelerated failure time (AFT) model in their study of Argentina's financial sector weakness measured by the ratio of non-performing loans to total loans found that both financial institutions specific indicators such as asset growth, the ratio of net worth to net assets, exposure to peso loans and institutional characteristics relating to private banks and foreign banks and macroeconomic variables including credit growth, foreign interest rate, reserve adequacy and monetary expansion, besides the tequila effect were reasons behind the banking fragility. Their empirical results suggested that the bank size measured by assets had a positive effect but asset growth had a negative effect on non-performing loans (NPLs). The variables such as operating cost, exposure to peso loans, credit growth and foreign interest rate had negative effect on NPLs. The macroeconomic variables such as money multiplier, reserve adequacy, institutional characteristics and tequila effect had a positive influence on NPLs.
Kroszner (2002) finds that non-performing loans are closely associated with banking crises. Sultana (2002) also links the Japanese financial crisis to non-performing loans and finds that Japanese banks still suffer under the weight of thousands of billions of yen of bad loans resulting from the collapse in asset prices a decade ago in the country's financial system. According to Mikiko (2002) during the past several years, major Japanese banks have struggled in the red, with business profits swallowed by the disposal of NPLs. This has seriously dented public confidence in the deposit system. Investigating how off-balance sheet activities affect bank risk, Hassan (1993), Cebeyonan&Strahan (2004), and Yong et al. (2009) find that credit expansion, credit quality, lending structure, cost of funds, Gap analysis, liquidity ratio, capital buffer, and size are significant bank specific variables (BSV). Hassan (1993) investigates the impact of loan sales on US bank risk exposures based on the single-factor CAPM and subordinated debt models. In contrast to Hassan (1993), Cebenoyan and Strahan (2004) evaluate the loan sales-risk relationship based on financial ratios.

Ahmad (2003) and Angbazo et al. (1998) find that management efficiency (MGT) is negatively related to credit risk of conventional banks and positive to Islamic banks. The positive sign of the coefficient in Islamic banking suggests that a higher proportion of earning assets to total assets, if not properly managed, would result in higher credit risk. For the conventional banks, the negative sign denotes that a lower efficiency in managing its earning assets would lead to a higher credit risk. A possible answer for the opposite signs probably lies in the nature of the earning assets where they are all interest based in conventional banking and loan default is immediately recognized after 3 months of arrears in interests. In Islamic banking, the earning assets are largely on murabahah and mudarabah mode of financing, where the credit risk is transferred to its investment depositors and the loan defaults are not recognized immediately.

Al-Tamimi (2002) investigated the degree to which UAE commercial banks use risk management techniques in dealing with different types or risks. The study found that the UAE commercial banks were mainly facing credit risk. The study also found that the inspection by branch managers and financial statement analysis were the main methods of risk identification. The main techniques used in risk management according to this study were establishing standards, credit score, credit worthiness analysis, risk taking and collateral. The study also highlighted the willingness of the UAE commercial banks to use the most sophisticated risk management techniques and recommended the adoption of conservative credit policy.

Das and Ghosh (2007) found a significant and positive relationship between one lag non performing loans and credit risk. During expansionary period, firms' earning and assets price tend to increase. Pursuant to these conditions, aggregate demand increase leads to increase in banks' lending. Banks may underestimate their risk exposure and reduce credit requirements and provision of future losses. During the next economic downtown, profitability and credit creditworthiness of borrowers decrease, fall in assets price affect borrowers' wealth and depressed the value of collateral, and thus non performing loans reveals (Quagliariello, 2007). The provision of loan losses levels are a useful summary of a bank's asset quality, the value of loan loss provisions reflects the rate of arrears and default on loans and the size of loss net of recovery of any collateral (Kearns, 2004).

Eng and Nabar (2007) found that the loan loss provisions are positively and significantly related with beginning loan outstanding and change in non-performing loans. This suggests that banks increase their provisions in response to an increase in credit risk. On another hand, Das and Ghosh (2007) found a strongly significant and positive relationship between credit growth and problem loan with a lag of one year. Accordingly, an increase in credit currently will have a negative impact on problem loan after one year. The bank's capital and risk are related to each other, when a borrower fails to pay its obligation, the defaulted amount results in losses that can eventually reduce bank's capital (Bessis, 2002; Saunders and Cornet, (2008). Bichsel and Blum (2004) found a positive and highly significant correlation between change in capital and risk. This indicates that the banks with strong capital base could engage in risky activities that increase their risk exposure. In contrast, Godlewski (2005) found a significant and negative correlation between capital ratio and credit risk measured by non-performing to total assets ratio.

Al-Smadi (2009) on their study on factors affecting banks' credit risk in Jordan found that the capital (CAP) is negatively but not significantly related with credit risk. This result is consistent

with the principle of Basle Accord for the capital adequacy ratio and empirical results of previous studies, which suggest that banks must maintain strong capital in order to absorb financial shocks. This result does not agree with those of Ahmad (2003) and Altunbas et al. (2007) who found a significant and positive relationship between capital and banks' risk in Malaysian and European banks respectively.

Al-Smadi (2009) in their study also found that the coefficient estimate of the provision of loan losses (PLL) is positively correlated with the credit risk as expected, but not significant. An increase of PLL level is an indicator of a deterioration of loan quality and potentially increases in credit risk. This result is similar to the finding of Cannata and Quagliariello, (2007) and Eng and Nabar, (2007). As expected, non-performing loans (NPL) is very significant. The positive sign of the coefficient suggests that the non-performing loan of one period is closely related to that of the previous period. When non-performing loans are not immediately written down, it is carried forward to the next year. Loan growth (GRL) is found significant and negative related to credit risk. The result explains that an increase of loan growth results in a decrease in credit risk. possible reason for GRL to be negatively related to credit risk is that when banks increase their lending pursuant to high demand of credit, they tighten their credit standards and keep loans under control, which reduce banks' credit risk exposure. In contrast, when banks have a large proportion of funds available for lending, they relax their credit standards. As a result, the probability of adverse selection and moral hazard activities increase which contributes to an increase in problem loans (Keeton, 2003). This result does not agree with those of Das and Ghosh (2007) and Salas and Saurina (2002). Locally, most of the studies in the area of credit risk management have been survey studies especially to microfinance institutions (MFIs) and banks. Mwirigi (2006) in his survey study approach examined the credit risk management techniques adopted by MFIs in Kenya. The study revealed that a significant number, that is, 92% of the respondents used credit management policies as a basis of objective credit appraisal. He identified credit risk as the most important risk with 80% of the respondents ranking it as the most important amongst other risks faced by the institutions. Kioko (2008) did a study on credit risk management techniques of unsecured loans of commercial banks in Kenya and revealed that banks used a combination of credit risk management methods for unsecured loans. This result was similar to the findings of Ngare (2008) who did a survey study of the credit risk management practices by commercial banks in Kenya and also Chege (2010) who surveyed the credit risk management practices and financial performance of MFIs in Kenya.

METHODOLOGY

This study used quasi experimental research design approach for the data analysis. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. It enables us therefore to observe the effects of explanatory variables on the dependent variables. The study used secondary data; the data is preferred in this study due to the nature of the study which is time series based. For the purpose of this study, secondary data will be source from Central Bank of Nigeria Statistical Bulletin, Financial Stability Report and Annual Reports of reporting commercial banks in Nigeria.

Model Specification

$AQ = \beta_0 + \beta_1 LIQR + \beta_2 CR + \beta_3 EXR + \beta_4 INTR + \beta_5 LR + \beta_6 CFR + \varepsilon_i$……. (1)

$EP = \beta_0 + \beta_1 LIQR + \beta_2 CR + \beta_3 EXR + \beta_4 INTR + \beta_5 LR + \beta_6 CFR + \varepsilon_i$……. (2)

AQ = Assets Quality indicator of bank soundness proxy by nonperforming loans to total loans and advances

EP = Earnings and profitability measured by profit after tax to operating expenses

LIQR = Liquidity Risk

CR = Credit Risk

EXR = Exchange Rate Risk

INTR = Interest Rate Risk

LR = Leverage Risk

CFR = Cash Flow Risk

Data analysis techniques

So as to achieve the stated objective, the collected time series data will be analyzed using descriptive statistics, correlation matrix and multiple linear regression analysis. The descriptive statistics (Mean values and standard deviations) will be used to analyze the general trends of the data from 2015-2024 based on the sample of 15 deposit money banks. The rational for choosing OLS is that, if the Classical Linear Regression Model (CLRM) assumptions 5 hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators(Brooks 2008). In addition, as noted in Petra (2007) OLS outperforms the other estimators when the following holds; the cross section is small and the time dimension is short.

Test of Significance

Parametric tests was estimated to determine the significance of the relationship using; The correlation coefficient (r), coefficient of determination (r^2), coefficient of multiple correlation(R^2), using F-Test, measures the strength and the direction of a linear relationship between the two variables. The coefficient of determination, r^2, determines the degree of linear-correlation of variables ('goodness of fit') in regression analysis. The coefficient of multiple correlation R^2 measures how well a dependent variable could be predicted using a linear function of a set of other variables (covariates).

ANALYSIS AND DISCUSSION OF FINDINGS

Effect of Financial Risk on Commercial Banks Asset Quality

Table 1: Test of Fixed Effect and Random Effects Models

Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.649182	(14,70)	0.0874
Cross-section Chi-square	25.655039	14	0.0286
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.782181	5	0.0074

Source: Extract from E-View Statistical Package 9.0 2025

The table above was presented to ascertain the appropriate model between the random effect and the fixed model. From the analysis the probability of Hausman test is less than the critical value of 0.05, therefore the study validate the use of fixed effect model.

Table 2: Presentation of Fixed Effect Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CFR	-1.205686	1.175803	-1.025414	0.3087
CR	-2.716238	1.790509	-1.517020	0.1338
EXR	-0.632259	1.567638	-0.403320	0.6879
INTR	2.972864	1.742365	1.706223	0.0924
LIQR	1.322153	1.374934	0.961612	0.3396
C	44.91030	21.09823	2.128628	0.0368

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.300773	Mean dependent var	34.96200
Adjusted R-squared	0.110983	S.D. dependent var	25.32692
S.E. of regression	23.88017	Akaike info criterion	9.377104
Sum squared resid	39918.38	Schwarz criterion	9.932617
Log likelihood	-401.9697	Hannan-Quinn criter.	9.601120
F-statistic	1.584764	Durbin-Watson stat	2.129033
Prob(F-statistic)	0.084841		

Source: Extract from E-View Statistical Package 9.0 2025

In evaluating the effect of financial risk on asset quality of commercial banks in Nigeria the study found that 30% variation on asset quality of commercial banks in Nigeria can be traced to financial risk of the quoted commercial banks in Nigeria while the remaining 70% is traceable to factors not captured in the model. However, the f-statistics proved that the model is significant. The Durbin-Watson statistics is greater than 2.0 but less than 2.5. this proved the absence of serial autocorrelation among the variables. the β-coefficient revealed that cash flow risk, credit risk and exchange rate risk have negative and insignificance effect on asset quality of Nigerian commercial banks while interest rate and liquidity risk have positive effect on asset quality of Nigeria

commercial banks. The findings above enable us to test for cross sectional difference between the fixed effect model and the random effect model.

Table 3: Cross Sectional Difference between Fixed Effect and Random Effect

Variable	Fixed	Random	Var(Diff.)	Prob.
CFR	-1.205686	-1.788156	0.185502	0.1763
CR	-2.716238	-1.148974	0.429543	0.0168
EXR	-0.632259	-0.487303	0.144995	0.7034
INTR	2.972864	3.051979	0.173307	0.8493
LIQR	1.322153	0.014194	0.370300	0.0316

Source: Extract from E-View Statistical Package 9.0 2025

The result proved that there is cross sectional difference between the fixed effect and random effect as the probability coefficient of credit risk and liquidity risk is less that 0.05, we reject null hypothesis that there is cross sectional difference between the two model. This enables us to test for unit root.

Effect of Financial Risk on Commercial Banks Earnings and Profitability

Table 4: Test of Fixed Effect and Random Effects Models

Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.525200	(14,70)	0.0000
Cross-section Chi-square	75.158821	14	0.0000
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.268018	5	0.0087

Source: Extract from E-View Statistical Package 9.0 2025

The table above was presented to ascertain the appropriate model between the random effect and the fixed model. From the analysis the probability of Hausman test is less than the critical value of 0.05, therefore the study validate the use of fixed effect model.

Table 5: Presentation of Fixed Effect Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	-0.339606	0.949135	-0.357806	0.7216
CFR	0.371331	0.623284	0.595765	0.5533
EXR	0.106017	0.830992	0.127579	0.8988
INTR	-0.656738	0.923614	-0.711053	0.4794
LIQR	0.650072	0.728841	0.891925	0.3755
C	40.77987	11.18400	3.646268	0.0005

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.591935	Mean dependent var	45.47048
Adjusted R-squared	0.481174	S.D. dependent var	17.57429
S.E. of regression	12.65869	Akaike info criterion	8.107694
Sum squared resid	11216.96	Schwarz criterion	8.663208
Log likelihood	-344.8462	Hannan-Quinn criter.	8.331710
F-statistic	5.344274	Durbin-Watson stat	1.422519
Prob(F-statistic)	0.000000		

Source: Extract from E-View Statistical Package 9.0 2025

The estimated regression model on the effect of financial risk on earnings and profitability of commercial banks found that 59% variation on the dependent variables can be explained by variation on the independent variables while 41% can be traced to factors not captured in the model the f-statistics fount that the model is statistical significant. The Durbin-Watson is less than 1.5 but greater than 1.0; this shows the presence of serial autocorrelation among the variables. The β-coefficient of the variables found that credit risk and interest rate risk have negative effect on earnings and profitability of commercial banks while cash flow risk, exchange rate risk and interest rate risk have positive effect on earnings and profitability of Nigerian commercial banks.

Table 6: Cross sectional comparison of fixed effect and random effect model

Variable	Fixed	Random	Var(Diff.)	Prob.
CR	-0.339606	-0.350809	0.027820	0.9464
CFR	0.371331	0.385936	0.011876	0.8934
EXR	0.106017	0.166179	0.008563	0.5156
INTR	-0.656738	-0.659734	0.010027	0.9761
LIQR	0.650072	0.660066	0.024379	0.9490

Source: Extract from E-View Statistical Package 9.0 2025

In comparing the fixed effect and the random effect this study adopt the probability coefficient. From the table above the probability coefficient of the variables are greater than the critical value of 0.05, we therefore conclude that there is no significant difference between the random effect and the fixed effect model. The analysis enables us to test for unit root using the Philip Peron Fisher Chi-square and the Philip Peron Choi-Z-test statistics.

Discussion of Findings

This model was formulated to investigate the effect of financial risk on asset quality indicators of commercial banks in Nigeria. Findings of the study proved that the independent variable can explain 30% variation on the dependent variable. The β-coefficient found that cash flow risk, credit risk and exchange rate risk have negative effect on asset quality indicator such that a unit increase on the variable will lead to 1.2% decrease, 2.7% decrease, and 0.6% decrease on asset quality. This finding confirm the a-prior expectation of the result and the conventional thought that excessive risk taking of commercial banks can endanger the operation of the industry. It is in line with the Basle capital regulation such as Basle I, Basle II and Basle III. The findings of the study confirm of Al-Smadi (2009) that the coefficient estimate of the provision of loan losses (PLL) is positively correlated with the credit risk as expected, but not significant. An increase of PLL level is an indicator of a deterioration of loan quality and potentially increases in credit risk and similar

to the finding of Cannata and Quagliariello, (2007) and Eng and Nabar, (2007). As expected, non-performing loans (NPL) is very significant.

However, the study found that interest risk and liquidity risk have positive effect on the asset quality indicators of commercial banks such as a unit increase will lead to 2.9% increase and 1.3% increase on asset quality indicator. This finding confirms our a-prior expectation and objective of liquidity such as shiftability theory, the real bill doctrine and commercial banks loan theory. The finding is supported by the empirical findings of Barth, Caprio, and Levine (2008) that restricting banking activities can reduce bank efficiency, but it could also increase the probability of default of the bank. They also found that stringent regulations are not statistically significant for the profit efficiency and the Ellul and Yerramilli (2010) Juanjuan et al. (2009) that the impact of credit risk management on profitability for the 4 commercial banks sampled is not the same. The study was limited to identifying the relationship of credit risk management and profitability of four commercial banks in Sweden. The results of this study was limited to the banks sampled and was not generalized for all commercial banks in Sweden

This model was formulated to examine the extent to which financial risk affects earnings and profitability of commercial banks in Nigeria. The findings show that financial risk explains 59% variation on the dependent variable. The β-coefficient found that credit risk and interest rate risk have negative effect on the earnings and profitability on commercial banks in Nigeria. This findings contrary to our expectation and could be traced to monetary and macroeconomic shocks. It could be also be traced to poor management quality and excessive trading. The coefficient fount that a unit increases on the variables will lead to 0.33% decrease and 0.65% decrease on earnings and profitability. The finding is contrary to operational objective of commercial banks which is to maximize shareholder's wealth. The finding is in line with the empirical findings of Murari (2012) that the probability of bankruptcy of Indian banks has declined over the years. Das (2012) examined insolvency risk of commercial banks in India for the period 1998–2007. He found that Indian private banks are most risky, whereas, the foreign banks are found to be least risky for their fat capital cushion and the findings of Beck, Demirgüç-Kunt, and Maksimovic (2008) that countries that require banks to regularly report their financial data to regulators and market participants are financially stable. The findings of Hermes and Meesters (2015) that the profit efficiency of commercial banks was conditional on the extent of financial regulation and financial liberalization and the findings of Gaganis and Pasiouras (2013) that the profit efficiency of the banks decreases with increases in a number of the financial institutions supervised by the central bank. The independence of central bank was found to be negatively and significantly related to the profit efficiency of banks.

However, cash flow risk, exchange rate risk and liquidity risk have positive effect on the earnings and profitability indicators of commercial banks such that a unit increase will lead 037, 010 and 0.65% increase on earnings and profitability of commercial banks in Nigeria. This findings confirm our a-prior expectation and other empirical findings such as Lee and Chih (2013) that the cost to income ratio and provision coverage ratio both were found to be more important for large banks, while the loans to deposits ratio, the capital adequacy ratio, and the leverage ratio are found to be more important for small banks and Lin, Seade, and Song (2013) that there is a positive and significant relationship between capital regulation and the bank efficiency. Moreover, they found

a significant relationship between efficiency and experienced supervisory and market based monitoring.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of financial risk on commercial banks soundness in Nigeria. The objective was to establish the relationship between financial risk and commercial banks soundness using cross sectional data for 15 quoted banks over a period of 10 years. two multiple regression were formulated with asset quality indicator and earnings and profitability indicator as dependent variables while financial risk was proxy by credit risk, interest rate risk, cash flow risk, exchange rate risk and liquidity risk. Findings from model I proved that the independent variable can explain 30% variation while β-coefficient proved that cash flow risk, credit risk and exchange rate risk have negative effect on asset quality indicator while interest rate risk and liquidity risk have positive effect on asset quality indicator. Findings further proved that the predictor variables can explain 59% variation on earnings and profitability indicators while the β-coefficient proved that credit risk and interest rate risk have negative effect while cash flow risk, exchange rate risk and liquidity risk have positive effect on earnings and profitability.

30% variation on asset quality indicator of Nigeria commercial banks can be predicted by variation on financial risk. Cash flow risk, credit risk and exchange rate risk have negative and significant effect while interest rate risk and liquidity risk have positive and significant effect, therefore the study conclude that financial risk have moderate effect on asset quality indicators of Nigerian commercial banks. The study found that 59% variation on earnings and profitability indicators of Nigerian commercial banks can be explained by financial risk as model in the study. Credit risk and interest rate risk have negative and insignificant effect on earnings and profitability indicators while cash flow risk , exchange rate risk and liquidity risk have positive and significant effect therefore we conclude that financial risk have significant effect on earnings and profitability indicators of Nigerian commercial banks.

Recommendations

i. The macroeconomic environment should be properly studied by management of commercial banks as a risk management tactics to eliminate the incidence of nonperforming loans and bad debts that exposes the institutions to credit risk.
ii. The department of credit administration should be managed by staffs with risk management knowledge. This will enhance effective credit administration and eliminate credit risk in Nigeria commercial banks.
iii. Strategies and policies should be formulated to increase cash flow from operations of Nigeria commercial banks to eliminate cash flow risk and bank should comply with liquidity management theories such as shiftability theory, commercial loan theory and real bill doctrine.

REFERENCES

Adeusi, Stephen Oluwafemi, Akeke, Niyi Israel, Adebisi,Obawale Simeon, Oladunjoye, Olawale (2013), risk management and financial performance of banks in Nigeria, *Journal of Business and Management,* Volume *14*, Issue *6.*

Ahmed, T. (2008) *Efficiency Analysis of Commercial Banks in Pakistan.* Doctoral Dissertation, University of Agriculture, Faisalabad.

Akani, H.W., & Lucky, A.L. (2022). Bankometer appraisal of commercial banks soundness in Nigeria**.** *Contemporary Journal of Banking and Finance*, 12(12), 1-13

Alam, N. (2013) Impact of Banking Regulation on Risk and Efficiency in Islamic Banking. *Journal of Financial Reporting and Accounting* 11:1, 29–50.

Barth, J. R., G. Caprio, and R. Levine (2008) Bank Regulations are Changing: For Better or Worse and Quest. *Comparative Economic Studies* 50:4, 537–563.

Beck, T., A. Demirgüç-Kunt, and V. Maksimovic (2008) Financing Patterns Around the World: Are Small Firms Different? *Journal of Financial Economics* 89:3, 467–487.

Burki, A. A. and G. S. K. Niazi (2003) The Effects of Privatisation, Competition and Regulation on Banking Efficiency in Pakistan, 1991-2000. In *CRC Conference on: Regulatory Impact Assessment: Strengthening Regulation Policy and Practice. Chancellors Conference Centre*, 26–

Das, A. and S. Ghosh (2009) Financial Deregulation And Profit Efficiency: A Nonparametric Analysis of Indian Banks. *Journal of Economics and Business* 61:6, 509–528.

Das, K. C. (2012) Banking Sector Reform and Insolvency Risk of Commercial Banks in India *IUP Journal of Applied Finance* 18:1, 19–34.

EngdaworkTadesse Awoke (2014*), impact of credit risk on the performance commercial banks in Ethiopia,* MSC thesis, Addis Ababa University, Addis Ababa-Ethiopia, Retrieved 20 September 2018.

Fu, X. M., Y. R. Lin, and P. Molyneux (2014) Bank Competition and Financial Stability in Asia Pacific.*Journal of Banking and Finance* 38, 64–77.

Hermes, N. and A. Meesters (2015) Financial Liberalisation, Financial Regulation and Bank Efficiency: A Multi-country Analysis. *Applied Economics* 47:21, 2154–2172.

Junaidu Muhammad Kurawa and SunusiGarba (2014), an evaluation of the effect of credit risk management on the profitability of Nigerian banks, *Journal of Modern Accounting and Auditing, ISSN 1548-6583,* Vol. *10,* No. 1, 104-115.

Khalil Elian Abdelrahim (2013), effectiveness of credit risk management of Saudi banks in the light of global financial crisis, *Journal of Asian Transactions on basic and applied Sciences*, Volume *03* Issue *02*.

Kolapo, T. Funso, Ayeni, R. Kolade and Oke, M. Ojo (2012), credit risk and commercial banks' performance in Nigeria, *Australian Journal of Business and Management Research,*Vol.*2* No.*02*,

Laeven, L. and R. Levine (2007) Is there a Diversification Discount in Financial Conglomerates? *Journal of Financial Economics* 85:2, 331–367.

LalarukhFarjana and Hossain M.Z. (2008). A Comparative Study of the PCBSs & NCBs of

Lee, T. H. and S. H. Chih (2013) Does Financial Regulation Affect the Profit Efficiency and Risk of Banks? Evidence from China‟s Commercial Banks.*The North American Journal of Economics and Finance* 26, 705–724.

Lepetit, L., E. Nys, P. Rous, and A. Tarazi (2008) Bank Income Structure and Risk: An Empirical Analysis of European Banks. *Journal of Banking and Finance 32:8, 1452–1467.*

Lucky, A. L., & Tamunoiduabia, I.F**,** (2022). Prudential stress test of capital adequacy of quoted commercial banks in Nigeria: A panel data approach: *IIARD International Journal of Banking and Finance, 8 (4), 48 –66.*

Lucky, A. L., Uzah, C.K., & Omubo-Pepple, N.S. (2023). Diversifiable risk and return on equity of quoted industrial goods manufacturing firms in Nigeria: *Journal of Banking and Investment, 1*(1), 127–147.

Lucky, A.L. (2017). Prudential determinants of commercial banks soundness in Nigeria. *M.Sc submitted to the department of banking and finance, faculty of management sciences, Rivers State University.*

Makkar, A., & Singh, S. (2012, June). Evaluating the Financial Soundness of Indian Commercial Banks: An Application of Bankometer. In *Proceedings of the National Conference on Emerging Challenges for Sustainable Business conducted at IIT Rurkee, Haridwar, India* (pp. 118-132).

Murari, K. (2012) Insolvency Risk and Z-Index for Indian Banks: A Probabilistic Interpretation of Bankruptcy. *The IUP Journal of Bank Management* 11:3, 7–21.

Taiwo AdewaleMuritala and Abayomi Samuel Taiwo (2013), credit management spurs higher profitability, evidence from Nigerian banking sector, *Journal of applied economics and Business*,V.*1*issue*2*, retrieved from http://www.aebjournal.org.pdf.

Toby, A.J., (2006). Essentials of corporate financial management. Department of banking and finance, Faculty of Management Sciences, Rivers State University of Science and Technology.

Zhang, J., P. Wang, and B. Qu (2013) Bank Risk Taking, Efficiency, and Law Enforcement: Evidence from Chinese City Commercial Banks. *China Economic Review* 23:2, 284–295.